

## CLAIMS

1. A multi-speed transmission comprising:
  - an input shaft;
  - an output shaft;
  - a planetary gear arrangement having first, second and third planetary gear sets, each planetary gear set having first, second and third members;
    - 5 said input shaft being continuously interconnected with said first member of said first planetary gear set, and said output shaft being continuously interconnected with said first member of said third planetary gear set;
    - 10 said first member of said second planetary gear set being integrally connected with said first member of said third planetary gear set; and said third member of said first planetary gear set being continuously connected with a transmission housing;
- 15 an interconnecting member continuously interconnecting said second member of said second planetary gear set with said second member of said third planetary gear set;
  - 20 a first torque-transmitting mechanism selectively interconnecting said second member of said first planetary gear set with said third member of said third planetary gear set;
  - 25 a second torque-transmitting mechanism selectively interconnecting said first member of said first planetary gear set with said third member of said third planetary gear set;
  - 30 a third torque-transmitting mechanism selectively interconnecting said third member of said second planetary gear set with said transmission housing;

a fourth torque-transmitting mechanism selectively interconnecting said second member of said first planetary gear set with said third member of said second planetary gear set;

30 a fifth torque-transmitting mechanism selectively interconnecting said first member of said first planetary gear set with said second member of said third planetary gear set;

35 a sixth torque-transmitting mechanism selectively interconnecting said second member of said second planetary gear set with said transmission housing; and

    said first, second, third, fourth, fifth and sixth torque-transmitting mechanisms being engaged in combinations of two to establish seven forward speed ratios and a reverse speed ratio between said input shaft and said output shaft.

2. The transmission of claim 1, wherein said first member of said second planetary gear set and said first member of said third planetary gear set comprise a single elongated ring gear.

3. The transmission of claim 1, wherein said first and second planetary gear sets are simple planetary gear sets, and said third planetary gear set is a compound planetary gear set.

4. The transmission of claim 1, wherein each of said first members is a ring gear, each of said second members is a planet carrier assembly member, and each of said third members is a sun gear.

5. The transmission of claim 1, wherein said first, second, fourth and fifth torque-transmitting mechanisms comprise rotating clutches, and said third and sixth torque-transmitting mechanisms comprise brakes.

6. The transmission of claim 1, wherein said first member of said second planetary gear set and said first member of said third planetary gear set comprise ring gears which are integrally connected by a sleeve to which both ring gears are splined.

7. The transmission of claim 6, further comprising a spacer and spring member positioned between said first member of said second planetary gear set and said first member of said third planetary gear set.

8. The transmission of claim 1, wherein said second torque-transmitting mechanism is positioned between said first and second planetary gear sets.

9. The transmission of claim 1, wherein said second torque-transmitting mechanism is positioned at a location which is not between said first, second and third planetary gear sets.

10. The transmission of claim 4, wherein said second torque-transmitting mechanism is engaged by a piston which is supported on and rotating with a housing member which is integrally connected with the ring gear of said first planetary gear set.

11. The transmission of claim 4, wherein said second torque-transmitting mechanism is engaged by a piston which is supported on and rotating with a housing member which is integrally connected with the planet carrier assembly member of said first planetary gear set.

12. A multi-speed transmission comprising:

an input shaft;

an output shaft;

a planetary gear arrangement having first, second and third planetary gear sets, each planetary gear set having a ring gear, a planet carrier assembly member, and a sun gear;

5                   said input shaft being continuously interconnected with said ring gear of said first planetary gear set, and said output shaft being continuously interconnected with said ring gear of said third planetary gear set;

10                  said ring gear of said second planetary gear set being integrally connected with said ring gear of said third planetary gear set; and said sun gear of said first planetary gear set being continuously connected with a transmission housing;

                        an interconnecting member continuously interconnecting said

15                  planet carrier assembly member of said second planetary gear set with said planet carrier assembly member of said third planetary gear set;

                        a first torque-transmitting mechanism selectively interconnecting said planet carrier assembly member of said first planetary gear set with said sun gear of said third planetary gear set;

20                  a second torque-transmitting mechanism selectively interconnecting said ring gear of said first planetary gear set with said sun gear of said third planetary gear set;

                        a third torque-transmitting mechanism selectively interconnecting said sun gear of said second planetary gear set with said transmission

25                  housing;

                        a fourth torque-transmitting mechanism selectively interconnecting said planet carrier assembly member of said first planetary gear set with said sun gear of said second planetary gear set;

30        a fifth torque-transmitting mechanism selectively interconnecting  
said ring gear of said first planetary gear set with said planet carrier  
assembly member of said third planetary gear set;

      a sixth torque-transmitting mechanism selectively interconnecting  
said planet carrier assembly member of said second planetary gear set with  
said transmission housing; and

35        said first, second, third, fourth, fifth and sixth torque-transmitting  
mechanisms being engaged in combinations of two to establish seven  
forward speed ratios and a reverse speed ratio between said input shaft and  
said output shaft.

13. The transmission of claim 12, wherein said ring gear of said  
second planetary gear set and said ring gear of said third planetary gear set  
comprise a single elongated ring gear.

14. The transmission of claim 12, wherein said first and second  
planetary gear sets are simple planetary gear sets, and said third planetary  
gear set is a compound planetary gear set.

15. The transmission of claim 12, wherein said first, second,  
fourth and fifth torque-transmitting mechanisms comprise rotating clutches,  
and said third and sixth torque-transmitting mechanisms comprise brakes.

16. The transmission of claim 12, wherein said ring gear of said  
second planetary gear set and said ring gear of said third planetary gear set  
are integrally connected by a sleeve to which both ring gears are splined.

17. The transmission of claim 16, further comprising a spacer  
and spring member positioned between said ring gear of said second  
planetary gear set and said ring gear of said third planetary gear set.

18. The transmission of claim 12, wherein said second torque-transmitting mechanism is positioned between said first and second planetary gear sets.
19. The transmission of claim 12, wherein said planet carrier assembly member of said second planetary gear set is continuously connected with said planet carrier assembly member of said third planetary gear set, and said second torque-transmitting mechanism is positioned at a location  
5 which is not between said first, second and third planetary gear sets.
20. A multi-speed transmission comprising:
  - an input shaft;
  - an output shaft;
  - a planetary gear arrangement having first, second and third  
5 planetary gear sets, each planetary gear set having a ring gear, a planet carrier assembly member, and a sun gear;
  - wherein said second planetary gear set is a simple planetary gear set, and said third planetary gear set is a compound planetary gear set;
  - 10 said input shaft being continuously interconnected with said ring gear of said first planetary gear set, and said output shaft being continuously interconnected with said ring gear of said third planetary gear set;
  - 15 said ring gear of said second planetary gear set being integrally connected with said ring gear of said third planetary gear set; and said sun gear of said first planetary gear set being continuously connected with a transmission housing;
  - wherein said ring gear of said second planetary gear set and said ring gear of said third planetary gear set are integrally connected by a sleeve to which both ring gears are splined, and a spacer and spring member are

positioned between said ring gear of said second planetary gear set and said

20      ring gear of said third planetary gear set;

            an interconnecting member continuously interconnecting said

            planet carrier assembly member of said second planetary gear set with said

            planet carrier assembly member of said third planetary gear set;

            a first torque-transmitting mechanism selectively interconnecting

25      said planet carrier assembly member of said first planetary gear set with said

            sun gear of said third planetary gear set;

            a second torque-transmitting mechanism selectively

            interconnecting said ring gear of said first planetary gear set with said sun

            gear of said third planetary gear set, wherein said second torque-transmitting

30      mechanism is positioned between said first and second planetary gear sets;

            a third torque-transmitting mechanism selectively interconnecting

            said sun gear of said second planetary gear set with said transmission

            housing;

            a fourth torque-transmitting mechanism selectively

35      interconnecting said planet carrier assembly member of said first planetary

            gear set with said sun gear of said second planetary gear set;

            a fifth torque-transmitting mechanism selectively interconnecting

            said ring gear of said first planetary gear set with said planet carrier

            assembly member of said third planetary gear set;

40      a sixth torque-transmitting mechanism selectively interconnecting

            said planet carrier assembly member of said second planetary gear set with

            said transmission housing; and

            said first, second, third, fourth, fifth and sixth torque-transmitting

            mechanisms being engaged in combinations of two to establish seven

45      forward speed ratios and a reverse speed ratio between said input shaft and

            said output shaft.

21. The transmission housing of claim 20, wherein said first, second, fourth and fifth torque-transmitting mechanisms comprise rotating clutches, and said third and sixth torque-transmitting mechanisms comprise brakes.

22. The transmission of claim 20, wherein said planet carrier assembly member of said second planetary gear set is continuously connected with said planet carrier assembly member of said third planetary gear set.